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THE UNITED STATES PATENT AND TRADEMARK OFFICE

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APPEAL BRIEF

Sir:

Pursuant to the Notice of Appeal filed in this case on July 7, 2010, Appellants present herewith their Brief on appeal.

I. TABLE OF CONTENTS

II.	Real Party in Interest	... 3
III.	Related Appeals and Interferences	... 4
IV.	Status of Claims	... 5
V.	Status of Amendments	... 6
VI.	Summary of Claimed Subject Matter	... 7
VII.	Grounds of Rejection to be Reviewed on Appeal	... 10
VIII.	Arguments	... 11
IX.	Conclusion and Signature	... 44
X.	Claims Appendix	... 45
XI.	Evidence Appendix	... 50
XII.	Related Proceedings Appendix	... 51

II. REAL PARTY IN INTEREST

The real party in interest is The University Court of the University of St. Andrews.

III. RELATED APPEAL AND INTERFERENCES

There are no related appeals, interferences, or judicial procedures under 37 C.F.R. §41.37(1)(c)(ii).

IV. STATUS OF CLAIMS

Claims 1-23, which are attached in Section X. Claims Appendix, beginning on page 43, are currently pending in this application. Claims 1-23 stand rejected. Specifically, claims 1-22 stand rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements. Claims 4, 6, and 9-12 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Claims 1-4, 6, 8-10, 22 and 23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,407,292 to Edrich ("Edrich") in view of U.S. Patent No. 6,777,684 to Volkov, et al. ("Volkov"). Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov as applied to claim 1, and further in view of U.S. Patent No. 5,760,397 to Huguenin, et al. ("Huguenin '397"). Claims 14, 15, 17 and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov as applied to claim 1, and further in view of U.S. Patent No. 5,047,783 to Huguenin, et al. ("Huguenin '783"). Claims 16 and 19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Edrich, Volkov and Huguenin as applied to claim 14, and further in view of U.S. Patent No. 5,231,404 to Gasiewski ("Gasiewski").

Claims 1-23 are currently under appeal.

V. STATUS OF AMENDMENTS

A Final Office Action was mailed on March 26, 2010. A Response to the Final Office Action was filed on May 26, 2010. In the Response to the Final Office Action, claims 1, 9, 10, and 19-22 were amended in response to a rejection under 35 U.S.C. §112, second paragraph. In the Advisory Action dated June 16, 2010, the Examiner states that "[t]he amendment to claim 9 changes the scope of the claimed invention to the extent that a new search and consideration would be required before a determination of patentability could be made," and that "[t]he proposed amendments would be effective to overcome the previous rejection of claims 1-22 as omitting essential elements and the rejection of claim 9 as being indefinite," (Advisory Action). Therefore, the amendments to claims 1, 9, 10, and 19-22, submitted in the Response to the Final Office Action were not entered.

An Amendment under 37 CFR §1.116(b)(2) to present claims 1-23 in better form for consideration on appeal and to reduce the issues for appeal was submitted on September 3, 2010. The amendment to claims 1-23 submitted in the Amendment under 37 CFR §1.116(b)(2) are identical to those submitted in the Response to the Final Office Action.

VI. SUMMARY OF THE CLAIMED SUBJECT MATTER

One aspect of the invention, as recited in claim 1, provides a non-contact passive medical scanning imager (FIG. 1, 1) for imaging subcutaneous body temperature. Means for scanning (FIG. 2; FIG. 5; FIGS. 12-16) scans a target area of a patient (Paragraphs 40-47 and 51-61). A detector (FIG. 2, 22) is configured to sense millimeter wave electromagnetic radiation that is emitted from the target area of the patient (Paragraph 41). A collector (FIG. 2, 42) is configured to collect the radiation that is emitted from the target area of the patient and directing that radiation along a collection path to the detector (FIG. 2, 22) in such a manner that the collected radiation has a defined sensitivity profile across and along substantially the entire length of the collection path (Paragraph 45). Electronic circuitry (FIG. 1, 2) is configured to generate image data associated with the target area of the patient based on the collected radiation (Paragraph 40). Means for isolation (FIG. 2, 28; FIG. 3, 28; FIG. 12, 28; FIG. 13, 28; FIG. 14, 73) in the collection path of the collected radiation prevents signal leakage being emitted from the detector towards the patient's body (Paragraphs 42-45, 51, 55, and 56).

Another aspect of the invention, as recited in claim 6, provides that the collector (FIG. 2, 42) collects the collected radiation having a Bessel sensitivity profile (Paragraph 55).

Another aspect of the invention, as recited in claim 8, provides that the collector includes means for focusing (FIG. 2, 40; FIG. 12, 40; FIG. 13, 40; FIG. 14, 75; FIG. 15, 92; Paragraphs 45, 46, 51, 55).

Another aspect of the invention, as recited in claim 9, provides that the means for scanning (FIG. 2; FIG. 5; FIGS. 12-16) is operable to be repeatedly rotated through 360° in the collection path (Paragraph 51).

Another aspect of the invention, as recited in claim 10, provides that the means for scanning (FIG. 2; FIG. 5; FIGS. 12-16) comprises a deflector (FIG. 2, 14) that is rotatable about one axis (FIG. 2, 16) to scan the collection path in a scanning direction across a body (Paragraph 41, 51, 52).

Another aspect of the invention, as recited in claim 13, provides that the imager (FIG. 1, 1) is operable to form an image from emitted radiation in the frequency range of 90-100GHz (Paragraph 41 and 50).

Another aspect of the invention, as recited in claim 14, provides at least one calibration load (FIG. 16, 96, 98) for emitting millimeter wave radiation at a pre-determined intensity, the collector (FIG. 2, 42) being operable to direct said radiation to the detector (FIG. 2, 22) to enable the imager (FIG. 1, 1) to be calibrated (Paragraph 60).

Another aspect of the invention, as recited in claim 15, provides that the calibration load (FIG. 16, 96, 98) is provided in the collection path of the imager (FIG. 1, 1), so that the imager (FIG. 1, 1) can be calibrated for each pass of the collector (FIG. 2, 42; Paragraph 60).

Another aspect of the invention, as recited in claim 16, provides that the at least one calibration load comprises two calibration loads (FIG. 16, 96, 98), further comprising means for maintaining the two calibration loads (FIG. 16, 96, 98) at different temperatures, the temperatures straddling a range of subcutaneous body temperatures to be imaged (Paragraph 61).

Another aspect of the invention, as recited in claim 18, provides polarization means for altering the polarization (FIG. 15, 88, 90) of received radiation to be aligned with the polarization of the detector (Paragraph 59).

Another aspect of the invention, as recited in claim 19, provides that the means for scanning (FIG. 2; FIG. 5; FIGS. 12-16) scans the target area of the patient such that the collection path is in the form of a circumference of a notional cylinder at each of a plurality of indexed steps (Paragraph 52).

Another aspect of the invention, as recited in claim 20, provides that a spot on the collection path resides on a focal plane of the means for scanning (FIG. 2; FIG. 5; FIGS. 12-16), such that the sensitivity profile is symmetrical and reduced about the spot along the collection path (Paragraph 53).

Another aspect of the invention, as recited in claim 21, provides that the defined sensitivity profile is non-uniform across and along the collection path based on known changes in a location of a focal spot of the means for scanning along the collection path (Paragraph 53).

Another aspect of the invention, as recited in claim 22, provides that the means for isolation (FIG. 2, 28; FIG. 3, 28; FIG. 12, 28; FIG. 13, 28; FIG. 14, 73) comprises a quasi-optical isolator (FIG. 2, 28; Paragraph 42-45, 51, 55, and 56).

VII. GROUND FOR REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-22 are unclear under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements, such as omission amounting to a gap between the elements.

2. Whether claims 4, 6, and 9-12 are unclear under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention.

3. Whether claims 1-4, 6, 8-10, 22, and 23 are obvious under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,407,292 to Edrich ("Edrich") in view of U.S. Patent No. 6,777,684 to Volkov, et al. ("Volkov").

4. Whether claim 5 is obvious under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov, and further in view of U.S. Patent No. 5,953,644 to Kool, et al. ("Kool").

5. Whether claim 13 is obvious under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov, and further in view of U.S. Patent No. 5,760,397 to Huguenin, et al. ("Huguenin '397").

6. Whether claims 14, 15, 17 and 18 are obvious under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov, and further in view of U.S. Patent No. 5,047,783 to Huguenin, et al. ("Huguenin '783").

7. Whether claims 16 and 19 are obvious under 35 U.S.C. §103(a) as being unpatentable over Edrich, Volkov and Huguenin '783, and further in view of U.S. Patent No. 5,231,404 to Gasiewski ("Gasiewski").

VIII. ARGUMENTS FOR CLAIMS 1-8, 10, 13-16, and 18-39

1. 35 U.S.C. §112, second paragraph, rejection of claims 1-22 as being incomplete for omitting essential elements.

Claims 1-22 were rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements, such as omission amounting to a gap between the elements. Claim 1 was amended to overcome the rejection under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements. However, the amendment to claim 1 submitted in the Response to the Final Office Action was not entered. In the Advisory Action dated June 16, 2010, the Examiner states that "[t]he proposed amendments would be effective to overcome the previous rejection of claims 1-22 as omitting essential elements," (Advisory Action). An Amendment under 37 CFR §1.116(b)(2) to present claims 1-23 in better form for consideration on appeal and to reduce the issues for appeal was submitted on September 3, 2010. Therefore, Representative for Appellant respectfully submits that the amendment to claim 1 should be entered, and that the rejection of claims 1-22 under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements should be rendered moot.

2. 35 U.S.C. §112, second paragraph, rejection of claims 4, 6, and 9-12 as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention.

Claims 4, 6, and 9-12 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. The Examiner asserts that claim 4 recites "the collected radiation having a Gaussian sensitivity profile" without sufficient antecedent basis, and that claim 6 recites "the collected

radiation having a Bessel sensitivity profile" without sufficient antecedent basis (Office Action, page 2). Representative for Applicant respectfully disagrees. Claim 1 recites both "a collector configured to *collect the radiation*," and "means for isolation in the collection path of *the collected radiation*," (emphasis added). Representative for Applicant respectfully submits that these phrases of claim 1, from which claims 4 and 6 depend, provide clear and explicit antecedent basis for the phrases "the collected radiation having a Gaussian sensitivity profile" and "the collected radiation having a Bessel sensitivity profile" recited in claims 4 and 6, respectively. Therefore, withdrawal of the rejection of claims 4 and 6 in view of 35 U.S.C. §112, second paragraph, is respectfully requested.

Claims 9 and 10 were amended to overcome the rejection under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. However, the amendment to claims 9 and 10 submitted in the Response to the Final Office Action were not entered. In the Advisory Action dated June 16, 2010, the Examiner states "[t]he amendment to claim 9 changes the scope of the claimed invention to the extent that a new search and consideration would be required before a determination of patentability could be made," and that "[t]he proposed amendments would be effective to overcome the previous rejection of...claim 9 as being indefinite," (Advisory Action). An Amendment under 37 CFR §1.116(b)(2) to present claims 1-23 in better form for consideration on appeal and to reduce the issues for appeal was submitted on September 3, 2010.

Representative for Appellant respectfully submits that the amendment to claim 9 does not materially change the scope of claim 9. Therefore, Representative for Appellant respectfully

submits that the amendment to claims 9 and 10 should be entered, and that the rejection of claims 4, 6, and 9-12 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention should be rendered moot.

3. 35 U.S.C. §103(a) rejection of claims 1-3, 10, 11, and 28 as being unpatentable over Edrich in view of Volkov.

In making a determination of obviousness under 35 U.S.C. §103(a), the scope and contents of the prior art are determined; the differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007); citing *Graham v. John Deere*, 383 U.S. 1, 17-18, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966).

i. The combination of Edrich and Volkov does not teach or suggest the recitations of claim 1.

The combination of Edrich and Volkov does not teach or suggest claim 1 to one of ordinary skill in the art because Edrich and Volkov, individually or in combination, fail to teach or suggest a collector configured to collect the radiation that is emitted from the target area of the patient and directing that radiation along a collection path to the detector in such a manner that

the collected radiation has a defined sensitivity profile across and along substantially the entire length of the collection path, as recited in claim 1, to one of ordinary skill in the art. In addition, Edrich and Volkov, individually or in combination, fail to teach or suggest means for isolation in the collection path of the collected radiation for preventing signal leakage being emitted from the detector towards the patient's body, as also recited in claim 1, to one of ordinary skill in the art.

In the Final Office Action dated March 26, 2010 (hereinafter "Final Office Action"), the Examiner contends that the interpretation of "defined sensitivity profile" is "itself so broad that it fails to set forth any substantive limitation for the term; 'it's general form' could be interpreted to mean anything including the mere knowledge that the profile is known to exist at all," (Final Office Action, pages 8-9). Representative for Appellant respectfully disagrees. The "general form" that is recited in claim 1 with respect to the sensitivity profile is recited as "defined", and is thus *a-priori* known. Representative for Appellant respectfully submits that a "general form" is a term of sufficient specificity to encompass more than just existence. "Form" is defined as "external appearance of a clearly defined area, as distinguished from color or material; configuration: *a triangular form*," or as "the shape of a thing or person," (form. (n.d.). *Dictionary.com Unabridged*. Retrieved May 24, 2010, from Dictionary.com website: <http://dictionary.reference.com/browse/form.>).

These definitions clearly establish that "general form" is with reference to the shape, appearance, and/or configuration of the sensitivity profile, and thus encapsulates more than its mere existence. In addition, such "general form" is recited as "defined", and is thus *a-priori* known, based on plain meaning definition and as supported by the Specification. Specifically,

"defined" is the past tense of the word "define", which means "to state or set forth the meaning of, to explain or identify the nature or essential qualities of, or to fix or lay down definitely; specify distinctly (defined. (n.d.). *Dictionary.com Unabridged*. Retrieved May 24, 2010, from Dictionary.com website: <http://dictionary.reference.com/browse/defined>). Thus, a plain meaning interpretation of "defined" is such that the meaning, the nature, and/or the specification was already set forth. This is further supported in the Specification, as also provided in the Previous Response, which states that "the sensitivity profile is defined in that its general form is known along the whole of the collection path," (Present Application, Paragraph 8).

Edrich discloses an imager that has a feedhorn and reflector in a near-field focusing arrangement to focus thermal radiation to a spot that indicates depth of temperature measurement based on a separation of the visible light beams (Edrich, col. 2, ll. 48-55 and 58-61; col. 3, ll. 60-64). The reflector height is automatically adjusted based on the desired depth of temperature measurement, and scanning height is automatically adjusted based on the desired depth of temperature measurement, and scanning is performed in a raster fashion along a line and orthogonal to that line (Edrich, col. 2, line 62 through col. 3, line 4). The teachings of Edrich are thus directed to a near-field focused arrangement that scans the thermal radiation at a known focal point that corresponds to the desired depth of thermal measurement.

In a near-field focusing arrangement, such as disclosed in Edrich, beam shape varies strongly with propagation distance, causing irregularity/asymmetry in the beam pattern at distances away from the focal plane. Support for this can be found in a number of sources. One such source describes the distinction between near-field and far-field focusing as follows:

In the far or Fraunhofer region, the measurable field components are transverse to the radial direction from the antenna and all power flow is directed radially outwards. In the far field, the shape of the field pattern is independent of the distance. In the near or Fresnel region, the longitudinal components of the electric field may be significant and power flow is not entirely radial. In the near field, the shape of the field pattern depends, in general, on the distance. (Antennas, J.D. Kraus, McGraw Hill, 2nd Edition, 1988, page 60).

The system of Edrich overcomes the variation of beam shape as a function of propagation distance by automatically adjusting the height of the reflector to maintain the desired depth of thermal measurement (Edrich, col. 2, line 62 through col. 3, line 4). Thus, there is no indication that Edrich contemplates antenna design considerations in overcoming beam shape variation as a function of propagation distance. In the Present Application, however, a fundamental Gaussian mode beam is implemented in scanning, which maintains its Gaussian intensity profile at all distances as it propagates through near and far fields, thus resulting in the defined sensitivity profile across and along substantially the entire length of the collection path, as recited in claim 1 (see, *e.g.*, Present Application, paragraph 45). In contrast, the collected radiation of Edrich maintains a uniform beam shape as it is being scanned based on the automatic adjustment of the height of the reflector to maintain the desired thermal measurement depth. If Edrich can be considered to disclose any sort of sensitivity profile of the collected radiation, such sensitivity profile would be constant, and thus the scanner is defining such sensitivity profile, as opposed to the sensitivity profile being defined (*i.e.*, *a-priori* known) along the collection path. Thus, Edrich provides no teaching or suggestion of scanning methods or implementations to result in comparable scanning that provides a defined sensitivity profile across and along substantially the entire length of the collection path, as recited in claim 1, to one of ordinary skill in the art.

In the Final Office Action, the Examiner responds to these specific distinctions between claim 1 and the teachings of Edrich with respect to the manner of imaging merely by dismissing the arguments based on the Court decision in *In re Van Geuns* (Final Office Action, page 9). Specifically, the Examiner states that "Examiner respectfully notes that the features relied upon which Applicant relies (i.e., the Gaussian mode beam, antenna design considerations, and functional propagation distance) are not recited in the rejected claim(s)," (*Id.*). Representative for Appellant respectfully submits that the discussion of "the Gaussian mode beam, antenna design considerations, and functional propagation distance", as set forth above, is merely to provide support for the reasons that Edrich fails to teach or suggest a collector in which the collected radiation has a defined sensitivity profile across and along substantially the entire length of the collection path, as recited in claim 1, to one of ordinary skill in the art. The Examiner fails to actually address and rebut these specific technical arguments that were made to demonstrate the differences between the teachings of Edrich and claim 1 based on language in the Specification that is supportive of the language of claim 1. Thus, Representative for Appellant respectfully maintains that Edrich fails to teach or suggest a collector in which the collected radiation has a defined sensitivity profile across and along substantially the entire length of the collection path, as recited in claim 1, to one of ordinary skill in the art.

The Examiner relies on Volkov for disclosure of means for isolation in the collection path of the collected radiation for preventing signal leakage being emitted from the detector towards the patient's body, as recited in claim 1 (Final Office Action, page 4). Specifically, the Examiner states that "Volkov teaches placement of a quasi-optical isolator 21 between the field of view and

the detector for the purpose of directing the radiation towards the imaging plane, which is interpreted to constitute prevention of signal leakage as claimed," (*Id.*). Representative for Appellant respectfully disagrees.

Volkov discloses that a quasi-optical element is disposed between the field of view and a multi-element receiver, and the quasi-optical element directs radiation from the field of view toward an imaging plane (Volkov, col. 3, line 67 through col. 4, line 3). The quasi-optical element to which Volkov refers is disclosed as merely being a lens that projects an image onto a receiver array (Volkov, col. 8, ll. 58-60). Thus, the quasi-optical *element* that is disclosed by Volkov is not a quasi-optical *isolator* (*i.e.*, the means for isolation, as recited in claim 1). Specifically, a lens does not prevent signal leakage from the apparatus into the collection path, as does the isolation means recited in claim 1 (see also Present Application, paragraph 10). There is no indication in the disclosure of Volkov that the disclosed lens provides the claimed signal leakage prevention. Instead, the lens of Volkov merely focuses the image onto the receiver array. Accordingly, Volkov does not teach or suggest means for isolation in the collection path of the collected radiation for preventing signal leakage being emitted from the detector towards the patient's body, as recited in claim 1, to one of ordinary skill in the art.

In the Final Office Action, the Examiner responds to the argument set forth above by contending that Volkov fails to disclose means for isolating (*e.g.*, quasi-optical isolator) by stating that "focusing of a radiation signal, by definition, constitutes isolation," (Final Office Action, page 9). Representative for Appellant respectfully disagrees, and respectfully submits that the Examiner has provided a definition for a "means for isolating" as set forth in claim 1, and

for a quasi-optical isolator, that is contrary to that which is disclosed in the Specification, in violation of 35 U.S.C. §112, sixth paragraph, and contrary to plain meaning.

The Federal Circuit Court has decided that 35 U.S.C. §112, sixth paragraph, states that a claim limitation expressed in means-plus-function language "shall be construed to cover the corresponding structure described in the Specification and equivalents thereof," and that "[i]f one employs means plus function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language." *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (in banc). The Specification clearly sets forth what is meant by the recited "means for isolating", such as the quasi-optical isolator described by FIG. 3 (Present Application, FIG. 3; Paragraphs 18 and 42-45). Nowhere does the Present Application say that the "means for isolating" can be considered a lens. Representative for Appellant thus respectfully submits that for the Examiner to assert that a lens corresponds to the claimed "means for isolating", the Examiner is applying the past, and no longer valid, practice of applying the broadest reasonable interpretation with respect to prior art while disregarding the structure disclosed in Specification in violation of the Federal Circuit decision in *In re Donaldson*. See *In re Donaldson Co.*, 16 F.3d 1189 (Fed. Cir. 1994); and MPEP, §2181.

In addition, for a number of reasons, a lens cannot reasonably be considered an equivalent of a quasi-optical isolator, such as disclosed in the Present Application. As well known in the art, focusing radiation does not "isolate it", but in fact does quite the opposite by concentrating it at a focal point. There is no indication that by focusing radiation that it would be isolated from any other radiation or external factors. Furthermore, the Examiner has failed to

adequately demonstrate how a lens, as taught by Volkov, can act to isolate radiation by being placed in the collection path of the claimed imager for preventing signal leakage being emitted from the detector towards the patient's body, as recited in claim 1. The Examiner asserts that the lens of Volkov acts as an isolator by channeling the "leakage" radiation toward the imaging plane (Final Office Action, page 9). However, such an assertion fails to sufficiently describe how the lens of Volkov can be incorporated into the imager of claim 1. Specifically, claim 1 describes that the detector receives the radiation that is collected by the collector, and would thus correspond to a location of an imaging plane. However, the means for isolating recited in claim 1 is described as isolating radiation that is emitted from the detector. Therefore, the Examiner's assertion that the lens of Volkov acts as an isolator by channeling the "leakage" radiation toward the imaging plane is technically incorrect with respect to the arrangement of elements recited in claim 1, as leakage would not be "channeled" to the detector, and thus the imaging plane, of the imager recited in claim 1.

As also known in the art, an optical or quasi-optical isolator, such as disclosed in the Present Application, acts as an optical or quasi-optical diode, in that it allows radiation to pass through in one direction and prevents the passage of radiation in the opposite direction. See, *e.g.*, <http://www.electronics-manufacturers.com/info/optoelectronics/optical-isolator.html>. This is how it is possible for the quasi-optical isolator in claim 1 to be located in the collection path to prevent signal leakage from the detector while still allowing the collected radiation to be received at the detector. By contrast, a lens, such as that disclosed by Volkov, is a two-way device, allowing radiation to flow freely in either direction. Thus, the Examiner further fails to

address how the lens of Volkov can be placed in the collection path recited in claim 1 to prevent signal leakage from being emitted to the patient's body from the detector, as recited in claim 1. For these reasons, a lens is not an equivalent of a quasi-optical isolator, such as disclosed in the Present Application.

In the Advisory Action dated June 16, 2010 (hereinafter "Advisory Action"), the Examiner responds to the above arguments by stating that "the definition of 'isolating' as set forth by Merriam Webster is 'to set apart from others'," and that "the concentration of the beam by a focusing element onto a point reasonably constitutes setting the beam apart from other possible radiation at that point," (Advisory Action). Representative for Appellant respectfully submits that Volkov in no way suggests that focusing light "sets the beam apart from other possible radiation at that point," as contended by the Examiner, and that such an interpretation of the meaning of the means for isolating (*i.e.*, quasi-optical isolator) is contrary to common sense. Specifically, Representative for Appellant fails to understand the Examiner's logic as to how focusing light at a focal point can set that light apart from other radiation, such as ambient radiation, that could possibly illuminate that focal point.

The Examiner also cites the Specification by stating that the Specification "sets forth the recited means for isolating as 'isolator 28 can take any suitable form'," and that "'for preventing signal leakage' does not structurally limit the claimed isolator," (Advisory Action; citing Present Application, paragraph 43). Representative for Appellant respectfully submits that, while the quasi-optical isolator described in the Specification can take any suitable form, such language does not grant liberty to the Examiner to interpret the language of claim 1 so broadly as to

change the definition and function of the quasi-optical from that described in the Specification and plain technical meaning. Thus, the Examiner is still required to interpret the meaning of "means for isolation", and by extension "quasi-optical isolator", based on the stipulations of 35 U.S.C. §112, sixth paragraph (see also, *e.g.*, MPEP §2111 and §2181). Furthermore, in providing this argument, the Examiner acknowledges an intent to invoke 35 U.S.C. §112, sixth paragraph, by stating "the recited *means for isolating* as 'isolator 28 can take any suitable form'," (Advisory Action, emphasis added). Thus, the Examiner's statement that "'for preventing signal leakage' does not structurally limit the claimed isolator," is incorrect and in violation of the law set forth in 35 U.S.C. §112, sixth paragraph, with respect to the amendment to claim 1 provided in the Response to the Final Office Action that was not entered and the Amendment filed September 3, 2010 (see also, *e.g.*, MPEP §2181). For all of these reasons, Volkov fails to teach or suggest a means for isolating, as recited in claim 1, to one of ordinary skill in the art.

For all of the reasons described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1 to one of ordinary skill in the art. Reversal of the rejection of claim 1, as well as claims 2-23 which depend therefrom, in view of Edrich and Volkov is respectfully requested.

- ii. The combination of Edrich and Volkov does not teach or suggest the recitations of claims 2-4.

Claims 2-4 depend from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teaches or suggests claim 1 from which claims 2-4 depend. Therefore, neither Edrich nor Volkov, individually or in combination, teaches or

suggests claims 2-4 to one of ordinary skill in the art. Reversal of the rejection of claims 2-4 in view of Edrich and Volkov is respectfully requested.

- iii. The combination of Edrich and Volkov does not teach or suggest the recitations of claim 6.

Claim 6 depends from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teaches or suggests claim 1 from which claim 6 depends to one of ordinary skill in the art. In addition, the combination of Edrich and Volkov does not teach or suggest claim 6 to one of ordinary skill in the art because Edrich and Volkov, individually or in combination, fail to teach or suggest that the collector collects the collected radiation having a Bessel sensitivity profile, as recited in claim 6, to one of ordinary skill in the art.

In the Final Office Action, the Examiner fails to address the merits of claim 6 based on the *previous* recitation of "such that" and based on a current and incorrect assertion of lack of antecedent basis. Specifically, claim 6 was amended in the Response to the Final Office Action dated August 3, 2009, filed December 29, 2009, claim 6 was amended from "wherein the collector is such that the collected radiation has a Bessel sensitivity profile," to "wherein the collector collects the collected radiation having a Bessel sensitivity profile." As the Examiner contended that claim 6 violated the enablement requirement of 35 U.S.C. §112, first paragraph, prior to the amendment, the Examiner refused to further examine claim 6 on the merits (Office Action dated August 3, 2009, page 3). In the Final Office Action, the Examiner failed to address the language of claim 6 entirely with respect to the cited art, but instead groups claim 6 into the

rejection of claim 1 (Final Office Action, page 4). In the Advisory Action, the Examiner likewise fails to address the specific language of claim 6 with respect to the cited art, but instead incorrectly maintains that claim 6 lacks proper antecedent basis (Advisory Action; see also Response to the Final Office Action, filed May 26, 2010, page 8).

Representative for Appellant respectfully submits that it is improper for the Examiner to ignore the language of claim 6 but maintain its rejection in view of the cited art. The MPEP states that "[t]he examiner ordinarily should reject each claim on all valid grounds available," that, "[m]ajor technical rejections on grounds such as lack of proper disclosure, lack of enablement, serious indefiniteness and *res judicata* should be applied where appropriate even though there may be a seemingly sufficient rejection on the basis of prior art," and that "a rejection on the grounds of *res judicata*, no *prima facie* showing for reissue, new matter, or inoperativeness (not involving perpetual motion) should be accompanied by rejection on all other available grounds," (MPEP, §707.07(g)). Furthermore, the MPEP states that "[e]ach claim (i.e., each "invention")...must be evaluated on its own merits for compliance with **all** statutory requirements," (MPEP, §2107.02; emphasis added), and that "[t]he examiner's action will be complete as to all matters..." (see 37 CFR 1.104(2), MPEP §707.07).

Representative for Appellant respectfully submits that neither Edrich nor Volkov, individually or in combination, teaches or suggests that collected radiation has a Bessel sensitivity profile, as recited in claim 6, to one of ordinary skill in the art. Reversal of the rejection of claim 6 in view of Edrich and Volkov is respectfully requested.

- iv. The combination of Edrich and Volkov does not teach or suggest the recitations of claim 8.

Claim 8 depends from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teaches or suggests claim 1 from which claim 8 depends. Therefore, neither Edrich nor Volkov, individually or in combination, teaches or suggests claim 8 to one of ordinary skill in the art. Reversal of the rejection of claim 8 in view of Edrich and Volkov is respectfully requested.

- v. The combination of Edrich and Volkov does not teach or suggest the recitations of claim 9.

Claim 9 depends from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teaches or suggests claim 1 from which claim 9 depends to one of ordinary skill in the art. In addition, the combination of Edrich and Volkov does not teach or suggest claim 9 to one of ordinary skill in the art because Edrich and Volkov, individually or in combination, fail to teach or suggest that the means for scanning is operable to be repeatedly rotated through 360° in the collection path, as recited in claim 9, to one of ordinary skill in the art.

In the Final Office Action, the Examiner states that the term "'operable' does not require explicit teaching or disclosure by the reference; so long as the reference structure is capable of performing the function, it meets the claim," (Final Office Action, page 10). Representative for Appellant respectfully submits that the term "operable" sets forth functional language, and respectfully submits that functional limitations must be evaluated and considered, just like any

other limitation of the claim, for what they fairly convey to a person of ordinary skill in the pertinent art in the context in which it is used (MPEP §2173.05(g)). Thus, Representative for Appellant respectfully submits that the Examiner's statement that the term "'operable' does not require explicit teaching or disclosure by the reference; so long as the reference structure is capable of performing the function, it meets the claim," is insufficient to adequately support a rejection of claim 9.

In the Advisory Action, in response to arguments directed towards the consideration of functional language, the Examiner contends that "where it is unsupported by structure to explicitly produce such function, the recitation is not given significant patentable weight," (Advisory Action). Representative for Appellant respectfully submits that the Examiner has provided no rule or law to such effect, such that this contention by the Examiner is completely unsupported. Such an assertion makes it unclear as to the type of supported structure is necessary, according to the Examiner, to enforce the rules cited above from the MPEP by Representative for Appellant, or to define what is meant by "*significant* patentable weight" by the Examiner (emphasis added). Even assuming that such a requirement exists, claim 9 describes a means for scanning (*e.g.*, the scanner described by FIGS. 2, 5 and 12-16), which is provided with more than sufficient description in the Specification as to the manner of achieving the functions described in claim 9, as mandated by 35 U.S.C. §112, sixth paragraph.

Representative for Appellant further respectfully submits that Edrich fails to disclose that the reflector of Edrich is capable of being rotated, manually or otherwise, as asserted by the Examiner (Final Office Action, page 10). The Examiner fails to provide any citation to Edrich to

support such a contention. As described above, Edrich discloses that scanning is performed in a raster fashion along a line and orthogonal to that line (Edrich, col. 2, line 62 through col. 3, line 4). Edrich fails to provide any indication, teaching, or suggestion to one of ordinary skill in the art that the reflector of Edrich is capable of being rotated. Therefore, Representative for Appellant respectfully maintains that neither Edrich nor Volkov teach or suggest claim 9 to one of ordinary skill in the art. Withdrawal of the rejection of claim 9 is respectfully requested.

Representative for Appellant respectfully submits that neither Edrich nor Volkov, individually or in combination, teaches or suggests that the means for scanning is operable to be repeatedly rotated through 360° in the collection path, as recited in claim 9, to one of ordinary skill in the art. Reversal of the rejection of claim 9 in view of Edrich and Volkov is respectfully requested.

- vi. The combination of Edrich and Volkov does not teach or suggest the recitations of claim 10.

Claim 10 depends from claim 9. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teaches or suggests claim 9 from which claim 10 depends to one of ordinary skill in the art. In addition, the combination of Edrich and Volkov does not teach or suggest claim 10 to one of ordinary skill in the art because Edrich and Volkov, individually or in combination, fail to teach or suggest that the means for scanning comprises a deflector that is rotatable about one axis to scan the collection path in a scanning direction across a body, as recited in claim 10, to one of ordinary skill in the art.

In the Final Office Action, the Examiner contends that "the recitation 'to scan the collection path...' is nothing more than a recitation of intended use, which is not given patentable weight," (Final Office Action, page 4). Representative for Appellant respectfully disagrees, and respectfully submits that the phrase "to scan the collection path in a scanning direction across a body," as recited in claim 10, is not intended use, but is instead a functional limitation that supports the recited structure. In other words, the claimed phrase provides a functional basis for the recited structure. The MPEP states that "[a] functional limitation is an attempt to define something by what it does, rather than by what it is," and that "[a] functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used." *Innova/Pure Water Inc. v. Safari Water Filtration Sys. Inc.*, 381 F.3d 1111, 1117-20 (Fed. Cir. 2004); see also, *e.g.*, MPEP §2173.05(g). Therefore, Representative for Appellant respectfully submits that the claimed phrase "to scan the collection path in a scanning direction across a body," as recited in claim 10, should be given patentable weight, and further respectfully submits that none of the cited art teaches or suggests claim 10 to one of ordinary skill in the art.

Representative for Appellant respectfully thus submits that neither Edrich nor Volkov, individually or in combination, teaches or suggests that the means for scanning comprises a deflector that is rotatable about one axis to scan the collection path in a scanning direction across a body, as recited in claim 10, to one of ordinary skill in the art. Reversal of the rejection of claim 10 in view of Edrich and Volkov is respectfully requested.

- vii. The combination of Edrich and Volkov does not teach or suggest the recitations of claim 20.

Claim 20 depends from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teaches or suggests claim 1 from which claim 20 depends to one of ordinary skill in the art. In addition, the combination of Edrich and Volkov does not teach or suggest claim 20 to one of ordinary skill in the art because Edrich and Volkov, individually or in combination, fail to teach or suggest that a spot on the collection path resides on a focal plane of the means for scanning, such that the sensitivity profile is symmetrical and reduced about the spot along the collection path, as recited in claim 20, to one of ordinary skill in the art.

In the Final Office Action, the Examiner contends that "since [Volkov] describes collection of a Gaussian beam, which inherently travels such that there is at least one spot about which it is symmetrical, the references meet the claim," (Final Office Action, page 10). Representative for Appellant respectfully disagrees, and respectfully submits that this assertion by the Examiner is technically inaccurate and that the Examiner has failed to address the language of claim 20 in its entirety. Claim 20 recites that a spot on the collection path resides on a focal plane of the scanning means, such that the sensitivity profile is symmetrical and reduced about the spot along the collection path. The rejection of claim 20 by the Examiner fails to address the relationship between the focal plane of the scanning means and the sensitivity profile along the collection path. Particularly, claim 20 describes the sensitivity profile *along the length of the collection path*, as well as the geometry of the sensitivity profile with respect to the focal plane of the scanning means, and is thus not merely describing a Gaussian beam. Therefore, the

rejection of claim 20 is deficient in that the language of claim 20 has not been adequately addressed, particularly with respect to the cited art.

In addition, Representative for Appellant respectfully submits that it would not have been obvious for one of ordinary skill in the art to combine the teachings of Edrich and Volkov to achieve the combination of elements of claim 20. Specifically, as described above with respect to claim 1, Edrich discloses automatically adjusting the height of the reflector to maintain a desired depth of thermal measurement to prevent beam shape variation (Edrich, col. 2, line 62 through col. 3, line 4). Thus, the scan of Edrich results in a uniform beam along a collection path. Therefore, even assuming *arguendo* that Volkov or any other cited art disclosed a beam having a profile which is symmetrical and reduced about a given spot along a collection path, such a beam would not be combinable with the system of Edrich because the system of Edrich teaches against beams having a variation along a collection path in a scan.

Representative for Appellant respectfully thus submits that neither Edrich nor Volkov, individually or in combination, teaches or suggests that a spot on the collection path resides on a focal plane of the means for scanning, such that the sensitivity profile is symmetrical and reduced about the spot along the collection path, as recited in claim 20, to one of ordinary skill in the art. Reversal of the rejection of claim 20 in view of Edrich and Volkov is respectfully requested.

- viii. The combination of Edrich and Volkov does not teach or suggest the recitations of claim 22.

Claim 22 depends from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teaches or suggests claim 1 from which claim 22 depends to one of ordinary skill in the art. In addition, the combination of Edrich and Volkov does not teach or suggest claim 22 to one of ordinary skill in the art because Edrich and Volkov, individually or in combination, fail to teach or suggest that the means for isolation comprises a quasi-optical isolator, as recited in claim 22, to one of ordinary skill in the art.

As described above regarding claim 1, neither Edrich nor Volkov teaches or suggests means for isolation in the collection path of the collected radiation for preventing signal leakage being emitted from the detector towards the patient's body, as recited in claim 1. As also described above regarding claim 1, the Specification clearly sets forth what is meant by the recited "means for isolating", such as the quasi-optical isolator described by FIG. 3 (Present Application, FIG. 3; Paragraphs 18 and 42-45), in conformance with 35 U.S.C. §112, sixth paragraph. Therefore, neither Edrich nor Volkov, individually or in combination, teaches or suggests that the means for isolation comprises a quasi-optical isolator, as recited in claim 22, to one of ordinary skill in the art. Reversal of the rejection of claim 20 in view of Edrich and Volkov is respectfully requested.

4. 35 U.S.C. §103(a) rejection of claim 5 as being unpatentable over Edrich in view of Volkov and Kool.

Claim 5 depends from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claim 5 depends, to one of ordinary skill in the art. The addition of Kool does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 1 from which claim 5 depends to one of ordinary skill in the art. Therefore, Edrich, Volkov, and Kool, individually or in combination, do not teach or suggest claim 5 to one of ordinary skill in the art. Reversal of the rejection of claim 5 in view of Edrich, Volkov, and Kool is respectfully requested.

5. 35 U.S.C. §103(a) rejection of claim 13 as being unpatentable over Edrich in view of Volkov and Huguenin '397.

Claim 13 depends from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claim 13 depends, to one of ordinary skill in the art. The addition of Huguenin '397 does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 1 from which claim 13 depends to one of ordinary skill in the art. In addition, the combination of Edrich, Volkov, and Huguenin '397 do not teach or suggest claim 13 to one of ordinary skill in the art because Edrich, Volkov, and Huguenin '397, individually or in combination, fail to teach or suggest that the imager is operable to form an image from emitted radiation in the frequency range of 90-100GHz, as recited in claim 13, to one of ordinary skill in the art.

In the Final Office Action, the Examiner rejects claim 13, reciting the frequency range of 90-100 GHz, based on overlapping ranges of 8-36 GHz, as taught by Edrich, and 30-300 GHz, as taught by Huguenin '397 (Final Office Action, page 5). The frequency range disclosed in claim 13 obviates the frequency range taught by Edrich, and Representative for Appellant respectfully submits that the disclosed range of 30-300 GHz taught by Huguenin '397 is insufficient to render obvious the frequency range of 90-100 GHz, as recited in claim 13.

The Federal Circuit has decided that, if the reference's disclosed range is so broad as to encompass a very large number of possible distinct compositions, this might present a situation analogous to the obviousness of a species when the prior art broadly discloses a genus. *In re Harris*, 409 F.3d 1339, 74 USPQ2d 1951 (Fed. Cir. 2005). See also *In re Baird*, 16 F.3d 380, 29 USPQ2d 1550 (Fed. Cir. 1994); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); MPEP § 2144.08. The frequency range recited in claim 13 (*i.e.*, spanning 10 GHz) is significantly narrower than the range disclosed in Huguenin '397 (*i.e.*, spanning 270 GHz), and should thus be considered a species of the broad genus disclosed in Huguenin '397. In addition, the Present Application is directed to subcutaneous imaging, and states that "the 90-100 GHz band gives a reasonable compromise between penetration depth and spatial resolution," (Present Application, page 12, ll. 26-28). In contrast, the system of Huguenin '397 is directed to detection of non-metallic weapons and explosives concealed under clothing (Huguenin '397, col. 1, ll. 9-16). Therefore, the frequency range recited in claim 13 is critical to the use described in the Present Application to achieve the intended results. The Federal Circuit has decided that criticality of a range can be used to rebut a prima facie case of obviousness based on an

overlapping range. See, e.g., *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). As a result, the frequency range disclosed in Huguenin '397 does not render claim 13 obvious.

The Examiner attempts to rebut the above arguments by asserting that the "suggestion that the reference range [of 30-300 GHz described in Huguenin '397] is analogous [to] a genus whereas the claimed range is analogous to a species is nothing more than a statement of opinion unsubstantiated by factual evident to prove that a skilled artisan would not be motivated to try to use a range of 90-100 GHz given a reference range of 30-300 GHz," (Final Office Action, page 10). The Examiner provides no basis for the claim that such an argument set forth in the Previous Response is a statement of opinion. The Examiner's statement also appears to completely disregard the established decisions by the Court set forth above, in that if the reference's disclosed range is so broad as to encompass a very large number of possible distinct compositions, this might present a situation analogous to the obviousness of a species when the prior art broadly discloses a genus. *In re Harris*, 409 F.3d at 1339. Thus, Representative for Appellant again respectfully submits that the fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness. *In re Baird*, 16 F.3d at 382. Therefore, because of the large difference in the frequency range between that described in Huguenin '397 and the claimed frequency range recited in claim 13, such a range described in Huguenin '397 does not render the claimed frequency range *prima facie* obvious.

Furthermore, in the Final Office Action, the Examiner also states that "the passage of the present specification reference in the arguments is not a clear, definitive statement that the range

of 90-100 GHz produces a novel, unexpected result, as is required in showing that a feature is patentably advantageous over the prior art," (Final Office Action, page 10). Representative for Appellant respectfully disagrees. The Present Application provides numerous details about the failure of other frequency ranges described in prior art to adequately image subcutaneous body temperature, but that the 90-100 GHz band gives a reasonable compromise between penetration depth and spatial resolution (Present Application, Paragraphs 2-4 and 49). In the Final Office Action, the Examiner appears to disregard these statements for establishing that the claimed 90-100 GHz range is critical, as well as the decision by the Federal Circuit that criticality of a range can be used to rebut a prima facie case of obviousness based on an overlapping range. See, *e.g.*, *In re Woodruff*, 919 F.2d at 1575. Therefore, Representative for Appellant respectfully maintains that Huguenin '397 fails to render the claimed frequency range obvious to one of ordinary skill in the art, particularly based on the disclosure of Huguenin '397 to image concealed weapons beneath clothing, which is unrelated to imaging subcutaneous body temperature (Huguenin '397, col. 1, ll. 9-16).

Representative for Appellant thus respectfully submits that Edrich, Volkov, and Huguenin '397, individually or in combination, fail to teach or suggest that the imager is operable to form an image from emitted radiation in the frequency range of 90-100GHz, as recited in claim 13, to one of ordinary skill in the art. Reversal of the rejection of claim 13 in view of Edrich, Volkov, and Huguenin '397 is respectfully requested.

6. 35 U.S.C. §103(a) rejection of claims 14, 15, 17, and 18 as being unpatentable over Edrich in view of Volkov and Huguenin '783.

- i. The combination of Edrich, Volkov, and Huguenin '783 does not teach or suggest the recitations of claim 14.

Claim 14 depends from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claim 14 depends, to one of ordinary skill in the art. The addition of Huguenin '783 does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 1 from which claim 14 depends to one of ordinary skill in the art. In addition, the combination of Edrich, Volkov, and Huguenin '783 do not teach or suggest claim 14 to one of ordinary skill in the art because Edrich, Volkov, and Huguenin '783, individually or in combination, fail to teach or suggest at least one calibration load for emitting millimeter wave radiation at a pre-determined intensity, the collector being operable to direct said radiation to the detector to enable the imager to be calibrated, as recited in claim 14, to one of ordinary skill in the art.

In the Final Office Action, the Examiner asserts that "the recitation 'for emitting...' is nothing more than a recitation of intended use unsupported by a clear recitation of structure configured to produce such function, and therefore the limitation is not given patentable weight," (Final Office Action, page 10). Representative for Appellant respectfully submits that at least one calibration load for emitting millimeter wave radiation at a pre-determined intensity is not language of intended use, as contended by the Examiner, but is instead functional language. Specifically, claim 14 sets forth a manner as to how the calibration load operates, thus allowing the collector to be operable to direct said radiation to the detector to enable the imager to be

calibrated, as recited in claim 14, and is not merely a statement of the environment or the application in which the calibration load is to be used. In other words, claim 14 describes that the emission of millimeter wave radiation as the pre-determined intensity is how the calibration load operates to allow the imager to be calibrated (*i.e.*, based on receiving the radiation), and thus describes how the calibration load *functions* to allow calibration of the imager. As described above with respect to claim 9, functional limitations must be evaluated and considered, just like any other limitation of the claim, for what they fairly convey to a person of ordinary skill in the pertinent art in the context in which it is used. *Innova/Pure Water Inc.*, 381 F.3d at 1117-20.

In addition, the Examiner contends that "Applicant is attempting to improperly limit the Office's interpretation of 'calibration' to only that which is described in the specification, when in fact Applicant has failed to clearly redefine the term to the extent that a skilled artisan would be put on clear notice that the term can only be interpreted that way in the context of the present invention," (Final Office Action, page 10). Representative for Appellant respectfully disagrees, and respectfully submits that the definition of "calibration" as set forth in the Specification and in claim 14 is merely a plain meaning definition of the term as understood by one of ordinary skill in the art. The Examiner, however, appears to be interpreting the definition of "calibration" in a manner that is contrary to such plain meaning by asserting that "noise cancellation", as taught in Huguenin '783, is equivalent to "calibration". Specifically, "calibration" is defined as "the act of checking or adjusting (by comparison with a standard) the accuracy of a measuring instrument," (<http://wordnetweb.princeton.edu/perl/webwn?s=calibration>). By contrast, Huguenin '783 provides an adequate definition of "noise cancellation", in which background noise is detected

and cancelled (Huguenin '783, col. 2, ll. 8-46). However, such noise cancellation does not contemplate comparison with a *standard* to adjust the accuracy of the imager of Huguenin '783. By contrast, the pre-defined intensity of the millimeter wave radiation can be considered a standard for purposes of adjusting the accuracy of the claimed imager. Therefore, the meaning of "calibration" as described in the Specification and in claim 14 is consistent with plain meaning definition as known in the art.

Representative for Appellant thus respectfully submits that Edrich, Volkov, and Huguenin '783, individually or in combination, fail to teach or suggest at least one calibration load for emitting millimeter wave radiation at a pre-determined intensity, the collector being operable to direct said radiation to the detector to enable the imager to be calibrated, as recited in claim 14, to one of ordinary skill in the art. Reversal of the rejection of claim 14 in view of Edrich, Volkov, and Huguenin '783 is respectfully requested.

- ii. The combination of Edrich, Volkov, and Huguenin '783 does not teach or suggest the recitations of claim 15.

Claim 15 depends from claim 14. For the reasons described above, Edrich, Volkov, and Huguenin '783, individually or in combination, do not teach or suggest claim 14, from which claim 15 depends, to one of ordinary skill in the art. The addition of Huguenin '783 does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 14 from which claim 15 depends to one of ordinary skill in the art. In addition, the combination of Edrich, Volkov, and Huguenin '783 do not teach or suggest claim 15 to one of ordinary skill in the art because Edrich, Volkov, and Huguenin '783, individually or in combination, fail to teach or suggest that the

calibration load is provided in the collection path of the imager, so that the imager can be calibrated for each pass of the collector, as recited in claim 15, to one of ordinary skill in the art.

In the Final Office Action, the Examiner states that "[s]imilar rationale [as to claim 14] applies to Applicant's arguments regarding claim 15," (Final Office Action, page 10).

Representative for Appellant respectfully submits that claim 15 recites different elements than claim 14, and that the Examiner fails to address the specific language of claim 15.

Representative for Appellant respectfully submits that none of the cited art teaches or suggests that the calibration load is provided in the collection path of the imager, so that the imager can be calibrated for each pass of the collector, as recited in claim 15, to one of ordinary skill in the art. Therefore, Edrich, Volkov, and Huguenin '783, individually or in combination, do not teach or suggest claim 15 to one of ordinary skill in the art. Reversal of the rejection of claim 15 in view of Edrich, Volkov, and Huguenin '783 is respectfully requested.

iii. The combination of Edrich, Volkov, and Huguenin '783 does not teach or suggest the recitations of claims 17 and 18.

Claims 17 and 18 depend from claim 1. For the reasons described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claims 17 and 18 depend, to one of ordinary skill in the art. The addition of Huguenin '783 does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 1 from which claims 17 and 18 depend to one of ordinary skill in the art. Therefore, Edrich, Volkov, and Huguenin '783, individually or in combination, do not teach or suggest claims 17 and 18 to one of ordinary skill

in the art. Reversal of the rejection of claims 17 and 18 in view of Edrich, Volkov, and Huguenin '783 is respectfully requested.

7. 35 U.S.C. §103(a) rejection of claims 16 and 19 as being unpatentable over Edrich in view of Volkov, Huguenin '783, Gasiewski.

- i. The combination of Edrich, Volkov, Huguenin '783, and Gasiewski does not teach or suggest the recitations of claim 16.

Claim 16 depends from claim 14. For the reasons described above, Edrich, Volkov, and Huguenin '783, individually or in combination, teach or suggest claim 14, from which claim 16 depends, to one of ordinary skill in the art. The addition of Gasiewski does not cure the deficiencies of Edrich, Volkov, and/or Huguenin '783 to teach or suggest claim 14 from which claim 16 depends to one of ordinary skill in the art. In addition, the combination of Edrich, Volkov, Huguenin '783, and Gasiewski do not teach or suggest claim 16 to one of ordinary skill in the art because Edrich, Volkov, Huguenin '783, and Gasiewski, individually or in combination, fail to teach or suggest the at least one calibration load comprises two calibration loads, further comprising means for maintaining the two calibration loads at different temperatures, the temperatures straddling a range of subcutaneous body temperatures to be imaged, as recited in claim 16, to one of ordinary skill in the art.

In the Final Office Action, the Examiner contends that "[a] skilled artisan would readily recognize as a matter of common sense that, since Edrich and Volkov are directed towards imaging the body, any teaching of temperature provided by Gasiewski should also be interpreted in light of typical body temperatures, and as such would find it obvious to try to modify Edrich

and Volkov with Gasiewski in the context of such body temperatures," (Final Office Action, page 11; citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007)). Representative for Appellant respectfully disagrees, and respectfully submits that the Examiner has provided no basis for the citation to *KSR*. As set forth in the Previous Response, Gasiewski discloses a spaceborne or airborne imaging system, which is a very different application of imaging from imaging subcutaneous body temperatures of a human patient, as recited in the claims of the Present Application. Thus, Representative for Appellant respectfully submits that there is no articulated reasoning with some rational underpinning to support the legal conclusion of obviousness for one of ordinary skill in the art to combine Gasiewski with Edrich, Volkov, and/or Huguenin '783 to achieve the combination of elements of claim 16, as required by *KSR*. *KSR*, 550 U.S. at 418.

Thus, Representative for Appellant respectfully maintains that one of ordinary skill in the art would not find it obvious to implement the "hot" and "cold" loads of Gasiewski as two calibration loads having temperatures that straddle a range of subcutaneous body temperatures to be imaged, as recited in claim 16. Accordingly, Edrich, Volkov, Huguenin '783, and Gasiewski, individually or in combination, do not teach or suggest claim 16 to one of ordinary skill in the art. Reversal of the rejection of claim 16 in view of Edrich, Volkov, Huguenin '783, and Gasiewski is respectfully requested.

- ii. The combination of Edrich, Volkov, Huguenin '783, and Gasiewski does not teach or suggest the recitations of claim 19.

Claim 19 depends from claim 1. For the reasons described above, Edrich and Volkov, individually or in combination, teach or suggest claim 1, from which claim 19 depends, to one of ordinary skill in the art. The addition of Gasiewski does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 1 from which claim 19 depends to one of ordinary skill in the art. In addition, the combination of Edrich, Volkov, Huguenin '783, and Gasiewski do not teach or suggest claim 19 to one of ordinary skill in the art because Edrich, Volkov, Huguenin '783, and Gasiewski, individually or in combination, fail to teach or suggest that the means for scanning scans the target area of the patient such that the collection path is in the form of a circumference of a notional cylinder at each of a plurality of indexed steps, as recited in claim 19, to one of ordinary skill in the art.

In the Final Office Action, the Examiner contends that "rotating a reflector along a central axis, and scanning along a 'conical swath' both satisfy the limitation of scanning such that the collection path has a shape of a circumference of a cylinder, wherein the cylinder may be irregular or regular in its lengthwise diameter," (Final Office Action, page 11). Representative for Appellant respectfully disagrees, and respectfully submits that the scanning described in Gasiewski is very different from scanning in a collection path that forms a notional cylinder. Gasiewski fails to disclose rotating a reflector *along* a central axis, but instead discloses that the reflector rotates in conical swaths from a fixed point (*i.e.*, the end-point of the central axis of a cone), such that the radiation is along rays that extend axially along the exterior of the cone (Gasiewski, col. 7, ll. 22-24; col. 9, ll. 25-28; col. 11, ll. 22-40). Therefore, the scanning

described in Gasiewski is not in the form of a circumference of a notional cylinder at each of a plurality of indexed steps, as recited in claim 19, because there is no notional cylinder, no circumference, and no indexed steps in the scan described in Gasiewski.

Furthermore, the scanning device of Gasiewski is based on an arrangement of a motor and a parabolic antenna for imaging targets in the context of radio astronomy, and thus scanning very distant targets (Gasiewski, col. 2, ll. 10-21). For the scanning device of Gasiewski to be modified in the manner recited in claim 19, such that the scan is in the form of a circumference of a notional cylinder at each of a plurality of indexed steps, as recited in claim 19, with or without the teachings of Edrich and/or Volkov, would render the equipment of Gasiewski unsatisfactory for its intended purpose. As decided by the Federal Circuit Court, if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984).

Therefore, Representative for Appellant respectfully submits that Edrich, Volkov, Huguenin '783, and Gasiewski, individually or in combination, do not teach or suggest that the means for scanning scans the target area of the patient such that the collection path is in the form of a circumference of a notional cylinder at each of a plurality of indexed steps, as recited in claim 19, to one of ordinary skill in the art. Reversal of the rejection of claim 16 in view of Edrich, Volkov, Huguenin '783, and Gasiewski is respectfully requested.

IX. CONCLUSION AND SIGNATURE

Please charge any deficiency or credit any overpayment in the fees for this Appeal Brief to Deposit Account No. 20-0090.

Respectfully submitted,

Date: 7 September 2010

/Christopher P Harris/
Christopher P. Harris
Registration No. 43,660

TAROLLI, SUNDHEIM, COVELL
& TUMMINO, L.L.P.
1300 East Ninth Street, Suite 1700
Cleveland, Ohio 44114
(216) 621-2234
(216) 621-4072 (Facsimile)
Customer No.: 26294

X. CLAIMS APPENDIX

1. (Finally Rejected) A non-contact passive medical scanning imager for imaging subcutaneous body temperature comprising:

means for scanning a target area of a patient;

a detector configured to sense millimeter wave electromagnetic radiation that is emitted from the target area of the patient;

a collector configured to collect the radiation that is emitted from the target area of the patient and directing that radiation along a collection path to the detector in such a manner that the collected radiation has a defined sensitivity profile across and along substantially the entire length of the collection path;

electronic circuitry configured to generate image data associated with the target area of the patient based on the collected radiation; and

means for isolation in the collection path of the collected radiation for preventing signal leakage being emitted from the detector towards the patient's body.

2. (Finally Rejected) An imager as claimed in claim 1, wherein the collector comprises a corrugated feedhorn.

3. (Finally Rejected) An imager as claimed in claim 1, wherein the collector comprises a waveguide configured to supply radiation to the detector.

4. . (Finally Rejected) An imager as claimed in claim 1, wherein the collector collects the collected radiation having a Gaussian sensitivity profile.
5. (Finally Rejected) An imager as claimed in claim 2, wherein the feedhorn is configured to convert a fundamental Gaussian mode beam of radiation into a waveguide mode in which radiation propagates through a wave guide to the detector.
6. (Finally Rejected) An imager as claimed in claim 1 wherein the collector collects the collected radiation having a Bessel sensitivity profile.
7. (Finally Rejected) An imager as claimed in claim 6 including an axicon in the path of the collected radiation and configured to convert a Gaussian sensitivity profile of the collected radiation to the Bessel sensitivity profile.
8. (Finally Rejected) An imager as claimed in claim 1 wherein the collector includes means for focusing.
9. (Finally Rejected) An imager as claimed in claim 1, wherein the means for scanning is operable to be repeatedly rotated through 360° in the collection path.

10. (Finally Rejected) An imager as claimed in claim 9, wherein the means for scanning comprises a deflector that is rotatable about one axis to scan the collection path in a scanning direction across a body.
11. (Finally Rejected) An imager as claimed in claim 10 further comprising a support that facilitates controlled line-indexing for moving the collection path in a direction perpendicular to the scanning direction.
12. (Finally Rejected) An imager as claimed in claim 11, wherein the support is operable to swing the deflector about a second axis perpendicular to the one axis.
13. (Finally Rejected) An imager as claimed in claim 1, wherein the imager is operable to form an image from emitted radiation in the frequency range of 90-100GHz.
14. (Finally Rejected) An imager as claimed in claim 1, further comprising at least one calibration load for emitting millimeter wave radiation at a pre-determined intensity, the collector being operable to direct said radiation to the detector to enable the imager to be calibrated.

15. (Finally Rejected) An imager as claimed in claim 14, wherein the calibration load is provided in the collection path of the imager, so that the imager can be calibrated for each pass of the collector.

16. (Finally Rejected) An imager as claimed in claim 14, wherein the at least one calibration load comprises two calibration loads, further comprising means for maintaining the two calibration loads at different temperatures, the temperatures straddling a range of subcutaneous body temperatures to be imaged.

17. (Finally Rejected) An imager as claimed in claim 1 wherein the detector is linearly polarized.

18. (Finally Rejected) An imager as claimed in claim 17 further including polarization means for altering the polarization of received radiation to be aligned with the polarization of the detector.

19. (Finally Rejected) An imager as claimed in claim 1 wherein the means for scanning scans the target area of the patient such that the collection path is in the form of a circumference of a notional cylinder at each of a plurality of indexed steps.

20. (Finally Rejected) An imager as claimed in claim 1 wherein a spot on the collection path resides on a focal plane of the means for scanning, such that the sensitivity profile is symmetrical and reduced about the spot along the collection path.
21. (Finally Rejected) An imager as claimed in claim 1 wherein the defined sensitivity profile is non-uniform across and along the collection path based on known changes in a location of a focal spot of the means for scanning along the collection path.
22. (Finally Rejected) An imager as claimed in claim 1, wherein the means for isolation comprises a quasi-optical isolator.
23. (Finally Rejected) An imager as claimed in claim 1, further comprising a computer configured to display an image associated with data of the collected radiation corresponding to the subcutaneous body temperature of the patient.

XI. EVIDENCE APPENDIX

There was no evidence relied upon in this brief that was submitted under 37 C.F.R. §§1.130-1.132, or otherwise submitted and entered into the record by the Examiner.

XII. RELATED PROCEEDINGS APPENDIX

There are no related appeals, interferences, or judicial procedures under 37 C.F.R. §41.37(1)(c)(ii).